Selected Material on Digital Sound Recording in the Federal District Court for Nebraska

Provided to Iowa's Digital Audio/Video Recording Technology Committee
by Judge Joseph Bataillon
July 2009

CHAPTER 16: ELECTRONIC SOUND RECORDING

PART 16.1 Statutory Requirements and Judicial Conference Policy

PART 16.1 Statutory Requirements and Judicial Conference Policy

16.1.1 Introduction

Effective January 1, 1984, the Judicial Conference approved the use of electronic sound recording equipment as a means of recording proceedings in federal district and bankruptcy courts, subject to the discretion and approval of the judge. This action enabled the use of analog tape recording equipment. In September 1999 the Judicial Conference also approved the use of digital audio recording technology as a means of taking the official record.

For either analog or digital recording technologies, the U.S. District Court Electronic Sound Recording Management Manual and the Electronic Court Recorder Operators' Manual provide specific information and forms which courts should use when district or bankruptcy court proceedings are to be recorded by electronic sound recording systems. The manuals are available from the District Court Administration Division in the Administrative Office. Forms used in conjunction with the electronic sound recording system are available from the General Services Administration, National Forms and Publications Center, Warehouse 4, Dock No. 1, 4900 South Hemphill Street, Fort Worth, Texas 76115.

16.1.2 Statutory Requirements

"Each session of the court and every other proceeding designated by rule or order of the court or by one of the judges shall be recorded verbatim by shorthand, mechanical means, electronic sound recording, or any other method, subject to regulations promulgated by the Judicial Conference and subject to the discretion and approval of the judge. The regulations promulgated pursuant to the preceding sentence shall prescribe the types of electronic sound recording or other means which may be used. Proceedings to be recorded under this section include (1) all proceedings in criminal cases had in open court; (2) all proceedings in other cases had in open court unless the parties with the approval of the judge shall agree specifically to the contrary; and (3) such other proceedings as a judge of the court may direct or as may be required by rule or order of court as may be requested by any party to the proceeding."

"The reporter or other individual designated to produce the record shall attach his official certificate to the original shorthand notes or other original records so taken and promptly file them with the clerk who shall preserve them in the public records of the court for not less than ten years."

"The reporter or other individual designated to produce the record shall transcribe and certify such parts of the record of proceedings as may be required by any rule or order of court including all arraignments, pleas, and proceedings in connection with the imposition of sentence in criminal cases unless they have been recorded by electronic sound recording as provided in this subsection and the original records so taken have been certified by him or her and filed with the clerk as provided in this subsection. He or she shall also transcribe and certify such other parts of the record of proceedings as may be required by rule or order of court. Upon the request of any party to any proceeding which has been so recorded who has agreed to pay the fee therefor, or of a judge of the court, the reporter or other individual designated to produce the record shall promptly transcribe the original records of the requested parts of the proceedings and attach to the transcript his official certificate, and deliver the same to the party or judge making the request." (28 U.S.C. § 753(b).)

For statutory authority governing magistrate judge proceedings, see Chapter 12 of this manual, Reporting for Magistrate Judges.

16.1.3 Judicial Conference Policy

"Effective January 1, 1984, pursuant to 28 U.S.C.§ 753(b), individual United States district court judges may direct the use of shorthand, mechanical means, electronic sound recording, or any other suitable method, as

PART 16.2 General Guidelines for Recording Proceedings by Electronic Sound Recording

16.2.1 Authority for Guidelines

These guidelines were issued by the Director of the Administrative Office of the United States Courts pursuant to regulations adopted by the Judicial Conference of the United States under 28 U.S.C. § 753(b). These guidelines shall not be construed to limit the discretion of a district judge to use a court reporter or other approved alternative method for recording proceedings.

16.2.2 Election to Use Electronic Sound Recording Equipment

a. A United States district judge, including a senior judge, a bankruptcy judge or a judge of a territorial district court, who elects to direct the full-time use of electronic sound recording to record official proceedings of the court should advise, as appropriate, the Chief of the District or Bankruptcy Court Administration Division of the Administrative Office. Note that the provision of funding for such equipment by the Administrative Office for a judge opting to convert to electronic sound recording *may* be limited to the extent that a balance of funds for contract court reporting remains available to the court.

b. The electronic sound recording equipment provided pursuant to these guidelines may not be used to back up court reporters, who are required by law to furnish their own equipment.

16.2.3 Deputy Clerks-Electronic Court Recorder Operators

a. The Administrative Office will:

(1) Provide electronic court recorder operator staffing credit to the court for each judicial officer electing to use electronic sound recording equipment.

(2) Issue an Electronic Court Recording Manual.

(3) Assist courts in evaluating the qualifications of transcription services for providing verbatim and timely transcripts in accordance with the transcript format approved by the Judicial Conference.

b. The Electronic Court Recorder Operator shall:

(1) Attach an official certificate to the analog audiotape or digital media which contains the recording of a proceeding.

Note: Regarding digital recordings, if a court maintains original digital audio recording files on high-capacity storage devices, such as a hard drive, which may contain many such recordings, the Electronic Court Recorder Operator should file a paper certificate with the clerk of court certifying that the original record of the proceeding was taken and identifying its file location. This could be done by date and time, with a list of all proceedings involved for that date.

(2) Maintain a log of the proceedings to be retained as an aid to the transcription of the record.

16.2.4 Responsibilities of the Clerk of Court

The clerk of court is responsible for the efficient and effective functioning of electronic sound recording systems. These responsibilities include:

a. Supervising electronic court recorder operators.

b. Preserving the audio records according to records disposition schedules established by law or the Judicial Conference.

c. Assigning operators to record proceedings as needed.

d. Cross-training personnel so that operators are available as needed.

e. Reproducing audio recordings and making them available as required by law, at the rates prescribed by the Judicial Conference.

f. Establishing a system for listening to the audio recordings in the courthouse.

g. Arranging for the transcription of the record, or such parts thereof, as may be requested by the court or a party.

(1) Sending a copy of the audio recording and a copy of the log to the transcription service.

(2) Receiving deposits from parties ordering transcripts, other than the United States, in an amount sufficient to cover the estimated cost of transcription.

(3) Monitoring payment of the transcription service upon receipt of the transcript and the extra copy for the records of the court; delivering the transcript to the party upon settlement of the account.

(4) Monitoring the actual fee charged to the party by the transcription service, so as not to exceed transcript rates as prescribed by the Judicial Conference.

h. Monitoring transcripts produced by transcription services to ensure that they conform to the transcript format requirements of the Judicial Conference.

Roller Pins: Stainless Steel.

Pressure Pad: Phosphor Bronze and Felt.

c. The following are required features of the cassette tape:

Length C90: 423 Feet, +5/-0 Feet.

Tape Type: High grade, low noise, music quality, ferric oxide formulation, with mylar back; must be coated with dark color, must have very low shedding characteristics; such as the TDK ADC series cassettes, the 3M-Scotch AVC series cassettes, or equivalents.

Leader: Must Be Clear (less than 10% grey).

Tape Oxide Translucence: Equal to or greater than 80% grey.

* The cassette cover must be one-piece clear soft plastic "soap dish" style with snap closing.

PART 16.4 Specifications and Guidelines for *Digital* Audio Recording Technology

16.4.1 Introduction

These guidelines contain information for courts to use in performing self-assessments when considering or implementing digital audio recording technology. As a preliminary step, courts may wish to review Exhibit 16.4-A, "Description of the Features of a Digital Audio Recording System," which provides an excellent overview of digital audio system functions and features. That exhibit has been excerpted from an evaluation study conducted by the Federal Judicial Center. The complete study is available for download from the Center's web site or may be obtained by faxing a request to the Center's Information Services Office at 202-502-4077.

Unless otherwise discussed, the information regarding statutory authority in 16.1.2, the authority and election to use electronic sound recording equipment in 16.2.1-16.2.2, the responsibility of the clerk in 16.2.3-16.2.4, and the ordering of tapes and transcripts in 16.5, applies to the use of digital audio recording technology. Courts using analog recording equipment should continue to refer to the electronic sound recording specifications set forth in Part 16.3 of this chapter.

16.4.2 Digital Audio Recording Technology Overview

Digital audio technology involves sound systems (microphones and mixers) and personal computers with specialized software and/or hardware working together. These systems provide sound recordings in a digital format and also may provide annotation capabilities to automate log notes and tie them to the digital voice record. No simultaneous text or transcript is produced beyond the recorder's log notes. Digital recording systems may be used with existing courtroom sound systems, and may require a computer in the courtroom for the deputy clerk monitoring the record. This computer, as well as a computer for the judicial officer, if desired, may be linked to either the court's local area network or used in stand- alone mode, depending on the design of the system. It should be noted that these systems do not provide an instantaneous transcript in the courtroom, and they provide different services that those offered by real-time court reporting methods.

Digital recording systems typically provide the ability to append electronic court recorder log notes to digital voice files, which can then be transmitted to transcriptionists, judges, and court staff electronically. This technology allows judges and court staff to listen to the record from their own computer workstations, and can allow judicial officers and law clerks to make their own private annotations to the digital voice record, if desired.

This method of taking the record may gradually replace analog recording systems because it allows recorded information to be stored in digital format, which is consistent with other computer-integrated courtroom technologies. The digital format will permit integration of the record with other elements of electronic case management systems, such as docketing and imaging, thereby enhancing access to the record for judicial officers, chambers and clerk's office personnel, the public, and the bar.

Digital audio recording technology can provide a reliable, accurate record of federal court proceedings and the basis for accurate, timely transcript delivery. However, due to the unproven advantages of these systems from a cost-benefit perspective, central funding beyond that provided for analog system cyclical replacement has not been authorized. Furthermore, no funds are expected to be available for digital audio recording technology through the judiciary's courtroom technologies program. Courts wishing to acquire digital audio systems must use local funds for any costs beyond those currently provided for analog systems.

In addition to these specifications and guidelines, courts interested in pursuing digital audio recording

l. Audible sound warning in the following situations:

(1) Detection of a prerecorded signal on a tape.

(2) Tape stops during recording.

(3) Broken tape.

m. Audible sound warning at least fifteen seconds in duration when the end of the tape is near and other transport is not ready to record.

n. Four-digit index display system with provisions for a remote index display.

o. A device to reset the digital index counter to "0" and to rewind the tape to the beginning of the audiotape upon insertion of a cassette audiotape.

16.3.3 Desired Analog System Equipment Features

The following features are not required but are desirable:

a. Public address output.

b. Audible sound warning at least fifteen seconds in duration in the event of a power loss or broken microphone line.

c. Eight hard-wired microphone inputs.

Top

d. Adequate input sensitivity to accommodate dynamic microphones. If condenser microphones are required, they should be phantom powered.

e. Portability of equipment.

f. A speaker jack which is separate from the jack for the headset used for off-tape monitoring.

g. An index display counter accurate within two digits in search or playback situations.

h. Audible sound recorded on the tape whenever the recording begins.

i. Automatic gain control for each channel.

16.3.4 Required Analog Cassette and Tape Features

a. Recording tape or cassette must be compatible with the recording machine.

b. The following are required features of the cassette case:

Type: Standard Phillips.

Body Material: Medium Impact, High Temperature Polystyrene.

Window: Hard Clear Plastic.

Bond: Screw Bond Joining, Top and Bottom.

Slip Sheet: Polyolefin or Silicone Impregnated Paper.

Guide Rollers: Delrin.

Tape Hubs: Delrin.

Roller Pins: Stainless Steel.

Pressure Pad: Phosphor Bronze and Felt.

c. The following are required features of the cassette tape:

Length C90: 423 Feet, +5/-0 Feet.

Tape Type: High grade, low noise, music quality, ferric oxide formulation, with mylar back; must be coated with dark color, must have very low shedding characteristics; such as the TDK ADC series cassettes, the 3M-Scotch AVC series cassettes, or equivalents.

Leader: Must Be Clear (less than 10% grey).

Tape Oxide Translucence: Equal to or greater than 80% grey.

* The cassette cover must be one-piece clear soft plastic "soap dish" style with snap closing.

The clerk of court is responsible for the efficient and effective functioning of electronic sound recording systems. These responsibilities include:

a. Supervising electronic court recorder operators.

b. Preserving the audio records according to records disposition schedules established by law or the Judicial Conference.

c. Assigning operators to record proceedings as needed.

d. Cross-training personnel so that operators are available as needed.

e. Reproducing audio recordings and making them available as required by law, at the rates prescribed by the Judicial Conference.

f. Establishing a system for listening to the audio recordings in the courthouse.

g. Arranging for the transcription of the record, or such parts thereof, as may be requested by the court or a party.

(1) Sending a copy of the audio recording and a copy of the log to the transcription service.

(2) Receiving deposits from parties ordering transcripts, other than the United States, in an amount sufficient to cover the estimated cost of transcription.

(3) Monitoring payment of the transcription service upon receipt of the transcript and the extra copy for the records of the court; delivering the transcript to the party upon settlement of the account.

(4) Monitoring the actual fee charged to the party by the transcription service, so as not to exceed transcript rates as prescribed by the Judicial Conference.

h. Monitoring transcripts produced by transcription services to ensure that they conform to the transcript format requirements of the Judicial Conference.

technology should refer to several other documents, either issued or soon to be issued by the Administrative Office, including: 1) an upcoming IRM Standard, to be issued by the Office of Information Technology; (2) an upcoming publication on how to use the courtroom technologies contracts, to be issued jointly by several offices within the agency; and (3) the existing courtroom technology manual, issued by the Space and Facilities Division.

16.4.3 Mandatory Minimum Requirements for Digital Recording Systems

An excellent overview of digital audio system functions and features is provided in Exhibit 16.4-A of this chapter, "Description of the Features of a Digital Audio Recording System." That exhibit is an excerpt from a study report on digital audio technology conducted by the Federal Judicial Center. While the list of potential capabilities is extensive, the Administrative Office has determined that a only limited number of minimum requirements must be met to provide the basic recording function. By limiting minimum requirements, the Administrative Office anticipates that vendors and courts will have greater flexibility to take advantage of ongoing technological advances and be able to tailor systems to each court's unique environment without undue restriction.

In addition to conforming with applicable guidelines for courtroom technologies and sound systems, digital audio recording systems must meet the following minimum requirements:

(1) Digital Sound Processing

By definition, a digital recording system must be able to convert the analog audio signal received from the microphones into a digital signal. This function is usually done with special hardware and/or software and is a core feature of every digital audio recording system. Value-added elements, often proprietary, may include mechanisms to boost or clarify the audio signal or save the recording in a compressed file format.

(2) Confidence Monitoring

The system must allow for confidence monitoring. This is a mechanism for ensuring that the audio signal has been recorded accurately to tape, disk, or other storage media. The mechanism accesses the already recorded signal from tape, disk, or other storage media (not the signal directly from the microphones) and transmits it to a headset worn by the court recorder who then is able to check the quality of the recording.

A digital recording system must have safeguards in place to prevent accidental erasure or over-recording of the record. The system must provide automatic error detection to ensure continuous, uninterrupted recording for clear playback and transcription. There also must be an output for a headset to allow for "off-media" monitoring, and a playback speaker in the courtroom to allow for replay of the record.

(3) Multi-channel Recording & Channel Isolation

The system must allow for multi-channel recording and channel isolation. Multi-channel recording is the capability to keep separate the audio signals received from different microphones. Channel isolation provides the ability to listen to one channel of the recording while turning off the others. Isolating a channel is particularly helpful when listening to or transcribing a playback by making it easier to hear what is being said in a microphone without competing sound from other microphones.

For in-courtroom use, 4-channel recording is the minimum requirement for a digital audio system. However, in circumstances where 4-channel capability is not advantageous, such as in recording proceedings conducted over a telephone (for which only one signal source would be available), courts may suspend the requirement. All multi-channel digital audio recording systems must provide channel isolation capability.

(4) Storage Mechanisms

All systems must be able to store the audio signal as a digital file. Typical options for doing this include storing the file on the hard disk of the recorder's workstation or on a local server. Some systems may also offer automated mechanisms for writing a copy of the session recording to secondary storage, either digital audio tape (DAT) or other high-capacity portable media, including writeable compact discs (CDs). System configurations that include a central server may also copy recording files to that server.

The DAT tape or other high-capacity media provides a mechanism for storing session material off-line, which can be restored to primary storage if older records no longer available on-line are needed. Copying data to a central server allows material from different courtrooms to be readily accessible to others.

(5) Playback Access

As a basic function, all digital systems must provide the capability to listen to material that was previously recorded through playback in or out of the courtroom. Courts considering digital audio systems may wish to establish ease and extent of playback access as major criteria in selecting or configuring a system. Depending on the system configuration, access may be achieved from the court recorder's workstation or from other networked locations (e.g., a workstation in chambers). Note that the ability to re-play recordings in chambers, on demand, without requiring assistance from the court recorder can be a major benefit offered by digital recording systems. Internet access is also a possibility; however, courts should ensure that adequate security measures are in place in accordance with applicable information resource management (IRM) policies.

(6) Capability to Duplicate Recordings

Although the digital audio format is likely to completely replace analog formats in the coming years, as of the date of these guidelines, much of the general public, attorneys, and transcription services are not equipped to use digital recording formats. Thus, courts implementing digital audio recording systems must maintain the capability to convert digital recordings to an analog format, typically on a cassette tape, as prescribed in current electronic sound recording guidelines.

The necessary duplicating and reformatting equipment must be able to provide 2-channel, analog recordings for general public use. In addition, if available transcriptionists cannot accommodate digital audio files, it would be necessary to provide a mechanism for converting 4-channel digital recordings to 4-channel analog. Conversely, if courts are able to locate transcriptionists who can accommodate digital media, it would not be necessary for the digital audio recording system to convert 4-track digital recordings to 4-track analog. Note that a 4-track digital to 4-track analog conversion capability may require the digital audio vendor to install additional hardware or software, thus increasing system costs.

Courts also may wish to explore the use of digital media, such as compact disc (CD) or digital audio tape (DAT) when providing copies of recordings to transcriptionists, attorneys, and/or the general public. It should be noted that, as of the release date of these guidelines, the availability of audio files via Internet access is possible, but may not be practical due to the large file size of the recordings.

(7) Archival Storage & File Formats

Recordings or annotation notes made by digital audio systems, like analog sound recordings, must be accessible for up to 20 years according to record retention schedules. To help ensure such future access, digital systems must be able to export files for archiving in a non-proprietary format. Alternatively, files may be reconverted to analog format using standard cassette audio tape as is currently acceptable for electronic sound recordings, or archived in digital format with an executable file that allows users to replay the recording independent of proprietary software.

This requirement is important because digital audio recording systems often use proprietary formats to store their data files. Thus, it is possible that recordings made in one court could not be accessed by a court that did not own a proprietary license for the vendor system that created the file. Similarly, as technology changes and new capabilities are incorporated into recording systems, even if a court is still using the same vendor, it may have a difficult time restoring a recording that is several years old. This situation would interfere with the clerk's responsibility to maintain a copy of the record that is accessible both now and in the future, according to records disposition schedules established by law or the Judicial Conference.

Currently, there are no approved file formats or storage media standards for digital audio files. However, the ".wav" format for digital audio is a publicly available, non-proprietary format that can be accessed from many different products and utilities. Standard ASCII text files can be used as a standard format for the session information and annotations. Records management issues and the need for a migration plan are discussed in section 16.4.5, Preliminary Needs Assessment.

(8) Common System for Transcribers

The federal courts endorse and encourage an open-systems approach to the implementation of digital audio recording systems within the federal judiciary. While the federal judiciary does not want to preclude arbitrarily any vendor from marketing products to transcription services, for transcription purposes digital audio recording systems used in the federal judiciary must be able to produce digital files in an industry standard format, such as ".wav" for audio or ASCII for text. In addition, transcribers must have the capability of isolating channels and adjusting the volume for each channel in order to transcribe accurately the record without requiring the transcribers to purchase proprietary hardware or software system components. To meet this purpose, digital audio files may be accompanied by an executable program that allows the receiving transcription service to listen to the recording, isolate channels, adjust volume, and view any related annotations.

(9) Emergency Backup

Courts should ensure that appropriate backup measures are in place when using digital audio recording systems, including emergency equipment and procedures to be used when the primary recording system fails and is unable to take the record of a proceeding. Options include having a spare workstation with the digital recording system pre-loaded and ready for service to continue recording; using a low-end digital system, such as a laptop with a recording sound board to take the audio record and taking hand notes; or reverting to a backup analog recorder and hand-written log notes. The emergency plan also should include a method for entering the recording and any annotations taken with the backup system into the primary digital recording system so that there are no gaps in the material accessible through the digital system.

Having a backup procedure that can be put in place quickly is important to ensure that system failures do not significantly disrupt court proceedings. Procedures that can be implemented by the court recorder, rather than requiring the assistance of systems staff, are preferred. For many courts, it may be most advantageous to rely on existing analog recording equipment, which is owned by the court and does not involve information technology issues, as the primary method of backup.

(10) Disaster Recovery Plan

Systems must include plans for off-line backup of the audio files and annotations database, as applicable, for disaster recovery. In some systems, the session DAT tapes or other high-capacity media provide a secondary storage mechanism that could fulfill this function. Also, periodic backups of the disks on the servers or workstations as part of the normal preventive maintenance routines could fulfill this function, even though the material from the digital recordings may be intermixed with general files from other court servers. Off-site storage of backup media is strongly encouraged.

(11) System Security

Systems must include procedures to provide basic identity checking to ensure that a potential user is a valid user of the system, and that he or she is provided the required level of access but no more. For systems that allow users other than court recorders, including judges, to make annotations or that allow users to declare their annotations "private," there must be security procedures to lock and unlock those files. If Internet access is offered, courts must ensure that security measures are in place in accordance with applicable information resource management (IRM) policies. Security issues and the need for a written security plan are discussed in Section 16.4.4 below.

16.4.4 Preliminary Needs Assessment for Digital Audio Systems

Extensive up-front planning is a critical element in the successful implementation of a digital audio recording system in a federal court setting. Such planning can be complex because there are so many components, interactions, and sources of information to consider, as well as the acquisition process and implementation. Therefore, this guide is provided as a tool for courts to use in planning for and successfully acquiring a digital audio recording system.

It is important that each court location carefully assess its requirements, distinguishing between desirable functionality ("wants") and required functionality ("needs"). Courts may find it helpful to establish a task force to assist in determining the needs and wants of the court. This will ensure that judges, chambers staff, courtroom staff, and transcriptionists are consulted regarding system features, and that automation staff provide input regarding the integration of potential new systems with the existing hardware, software, and networks. System requirements should be standardized as fully as possible in each court to make providing system support easier and to reduce time and costs for training operators and judicial officers.

At a minimum, courts should consider the following critical areas when making preliminary assessments of their requirements and corresponding system capabilities:

(1) Centralized or Courtroom-Based System Configuration

In describing the possible different configurations for digital audio recording systems, it is important to distinguish between "stand-alone," "networked," and "central server" systems. Essentially "stand-alone" refers to a configuration where all the components of the digital audio recording system reside on the court recorder's workstation in the courtroom. This is in comparison to the "networked" configuration where some of the components of the digital audio system are located in the courtroom and some are located elsewhere. As long as all of the storage and access to the digital audio recording functions are maintained solely on the workstation in the courtroom, it can be considered stand-alone -- even if the workstation is also used to run e-mail over the network, for example.

However, when a digital audio recording system function is performed over the network -- for example, backups to a storage device -- then it is considered to be a "networked" system. The networked system is described as being on the network and allowing other computers on the network to share access to the digital audio files on the main recording system in the courtroom. It also allows for the possibility of sharing disk storage and other peripherals that are on the network and not directly attached to the court recorder's workstation.

There may be two types of "stand-alone" configurations. The "isolated stand- alone" system is described as being totally isolated from the network and other computers, with all components physically attached to the court recorder's workstation located in the courtroom. The "participating stand- alone" system is described as having all of the components for the digital audio recording system confined to a single workstation in the courtroom, but that workstation is connected to the court's network and can share in other network services for purposes not related to digital audio recording.

A "central server" configuration is one in which audio signals are sent from several courtrooms to servers and monitoring equipment in a single centralized control room. This approach requires less equipment in the courtroom and allows for more efficient use of servers, storage disks, and other peripherals. A court recorder in the central location records and monitors sessions being held in more than one courtroom at a time, logging one session while ensuring that the equipment is functioning properly in all others. A courtroom-based configuration maintains the recording, monitoring, and note-taking equipment and processes in the courtroom itself, with only long-term file storage in a central location.

Courts interested in pursuing the centralized option should be aware that because of the type and level of log notes taken in most federal courtrooms, a single court recorder would not be able to fully annotate the proceedings in multiple courtrooms. Thus, to the extent that sound quality and an acceptable transcript depends on constant attention to the recording and on detailed log notes, central monitoring of multiple courtrooms is not recommended.

(2) Hardware and Software Compatibility & Network Capacity

Digital recording equipment may require new hardware and software as well as changes in the court's existing network configuration and computer systems support. It is important for the court to work with potential vendors to identify potential problems and opportunities. Each offeror must provide minimum specifications and cost estimates during the market research phase of the acquisition process.

- Understand how the court's existing hardware and software will be used, with or without upgrades, in the digital recording system.
- Identify additional hardware and software that would be required and how that would be integrated into the court's current computer environment. In this regard, potential conflicts with existing hardware and software should be identified.
- Perform a detailed analysis of existing network capabilities in relation to the additional requirements that would be imposed by a digital audio recording system. Determine additional server needs and other network equipment or connectivity requirements. Assess system integration issues.

All requirements must be set forth in the statement of work. (See Volume 13, Chapter 14 of the *Guide to Judiciary Policies and Procedures* for procurement guidance.)

(3) Sound Systems

Courts should also work with digital audio recording system vendors to determine if their existing sound systems are adequate for the products under consideration. If installation of a digital audio system would require modification to existing sound systems, the court should consider using the services of one of the AO's audio/video design term contractors available through the Space & Facilities Division. These designers can ensure that existing sound systems are modified appropriately to accommodate this new digital technology. *Note: digital audio recording system vendors should not open, adjust, or work in the court's existing audio sound system cabinets since this could invalidate warranties or maintenance contracts on the sound systems.*

(4) Record Annotation Options

Using a digital audio recording system to take the record of a proceeding can offer advantages, such as improved sound quality, easier access through electronic retrieval or transmission, and inclusion as an element in an electronic case file.

In addition, digital audio also typically offers the opportunity to directly link the audio file to the recorder's notes (or annotations made by others) for easy search, replay, or transcription. Alternatively, digital audio can allow notes from an external source, such as WordPerfect, to be related to the audio file via time synchronization.

Courts interested in digital audio recording systems should consider the following issues related to record annotation:

- The advantages of an integrated note-taking/recording system may include better linkage between log notes and the audio file(s) to which they relate. Disadvantages may include the need for a data base file to maintain the log notes, more difficulty in editing log notes, and greater reliance on proprietary formats.
- Using a separate note-taking system, such as WordPerfect, may offer the advantage of easier editing, reliance on industry standards, and less technical complexity. However, the lack of direct integration with the audio record may require greater user set-up time and adversely affect the ability to access and play back selected parts of the record.
- In evaluating integrated or separate system designs for note-taking or any other digital audio features, courts should test all systems and procedures to ensure that they meet the requirements set forth in the Statement of Work.

    - Evaluate the level of effort required to set up a recording session. Consider whether setup information can be adjusted from session to session or must be completely reentered each time.

    - Determine whether the screens accommodate all of the information that court recorders and/or transcribers need to enter into the log, such as names and addresses for all attorneys.

    - Consider whether court recorders can enter this information at a convenient time and without disruption to court proceedings.

    - Consider whether the court recorder's notes can be edited after they are entered.

    - Evaluate whether electronic court recorders can maintain the same level of quality with the new note-taking system as they achieved with the older system of log notes.

- Be sure to consult with your court's judges as to whether they want to take private notes from the bench that could be integrated with the audio record. If so, involve them in selecting the design.

(5) System Integration Opportunities and Data Storage

Integrating a digital audio recording system with a court's case management system to import case information electronically can save data entry time and reduce errors. Consult with the case management system's designers and supporters as to the feasibility of such integration. While the technology for integration is likely to be available, cost will probably be a key issue. In addition, depending on each court's determination of needs, this functionality may or may not be a system

requirement for every court. Integration requirements must be identified specifically in the Statement of Work.

(6) Impact on Court Operations

A new recording system may have an effect on how the court functions. Courts must evaluate the following:

- Modifications, if any, that may be required in current courtroom, chambers, or clerk's office procedures to accommodate a new way of doing business.
- Physical impacts on the courtroom or other operational areas, including impact on courtroom aesthetics, court recorders' line of sight, and access to aisles and exits. Wiring issues and the ability to "hide" equipment should be reviewed carefully, particularly in older or ceremonial courtrooms.
- Impacts on staffing requirements, such as requirements for extra systems support and training.

(7) Product Suitability and Customization Requirements

In considering the purchase of a digital audio system, courts must determine whether the product under consideration accommodates the way cases are handled, e.g., appellate, bankruptcy, district, or magistrate matters.

- Carefully assess the product's capabilities and features to determine the extent of customization, such as special screens or "hot keys," that may be required to handle particular proceedings, including motion calendars, or special cases, such as sealed cases. If special screens and/or "hot keys" are needed, establish a testing and training period to ensure their functionalities and capabilities.
- If customization is needed, responsibility for making the changes must be firmly established under the court or the vendor. If the vendor is required to customize the product, make sure that the required customization is defined in the statement of work. A vendor's proposal will then address the changes to be made with performance deadlines. The contract must include a requirement to support the system in the future with all customization.
- If the court would be responsible for customizing the system, the court must ensure that it has adequate technical expertise and determine the extent of assistance, including software, manuals, or technical support, that the vendor must provide to help make such customization possible. Also, the court should consider whether such customization would affect vendor support or warranty provisions.
- Courtroom staff, including those responsible for electronic sound recording, should be involved in evaluating proposals. Arrange for an actual in-courtroom test of a product, rather than a simple office demonstration, as well as an explanation of training requirements and the kind of training to be provided.
- If possible, make a site visit to another court with a system already installed and operating.

(8) Records Management Issues

Implementation of audio digital recording raises a number of records management issues. Central to these concerns is cost. Analog tapes require some maintenance over their record life span. Tapes deteriorate and must be stored in an acceptable temperature and humidity range. Digital records are susceptible to obsolescence of the software to read them and the hardware upon which they are stored. As a result, they need more care-taking and periodic refreshes for both hardware and software. This will involve unknown future costs that may be multiples of the original costs to capture the material.

A specific time period needs to be established to review the technical environment of the collection. Optimally, this review would occur no later than every three years and would include an examination of the currency of the stored file formats; the currency of the indexing database; the currency of the storage media; and the currency of the retrieval software. Should any of these elements be found to be obsolete, a migration plan would need to be developed. This plan would provide equipment descriptions, including how the new equipment would meet the judiciary's architecture guidelines, costs, implementation schedules, and testing procedures. Because of the unknown future cost of storing digital media, the time period that these records are considered for destruction may be reexamined by the Administrative Office within the next several years to minimize the cost of future migrations. The 10-20 year current retention period may not be appropriate in all cases.

(9) Transcription Issues

A court must consider assessing its need and the court community's need for transcription services. If transcripts are regularly needed either by judges or attorneys, the court must determine whether transcription companies are available to transcribe the record.

- Courts may find that if judges can easily listen to the record in chambers, or attorneys have access to the record via the Internet, the demand for transcripts may decrease.
- Moreover, the court must consider the use of digital audio recording technology with transcription firms to assess the readiness of the firms to make the switch to digital transcription. Providing sufficient volume to make the transcription company's special equipment purchase worthwhile may be an issue.
- The court must work with transcription services and digital audio vendors to determine what special equipment and procedures may be needed to send digital audio files to transcription firms. It may be possible to send the files via the Internet or modem, but special procedures will be necessary for the transcription of sealed and other sensitive proceedings.
- Courts also will have to determine whether the equipment they are considering meets the needs of their transcription companies. Foot pedals that meet industry standards must be used. The transcription software must allow them to keep their hands on the keyboard as much as possible and have windows and fonts that are sizeable and capable of displaying more than one line of text at a time. And, to assist transcribers in the identification of speakers, the digital recording software must time stamp the log notes when a court recorder begins the log note rather than at the completion of the note.
- Each court must be responsible for identifying transcription service providers that are capable of accommodating digital recording files.

(10) Training

A well-conceived training program is essential when implementing a digital audio recording system. The training program must be tailored to the background and needs of the users, including judges, electronic court recorders, and transcribers, and must provide training materials and reference manuals that can be used after the training is completed. If a court's computer systems staff are to provide ongoing hardware and/or software support to users, they must be trained as well. With sufficient training, systems staff may be able to diagnose and, perhaps with telephone assistance from the vendor, resolve problems that would otherwise require site visits. Training requirements must be identified specifically in the Statement of Work.

Responsibility for training should not fall entirely on the vendors. A court must help by identifying user needs (e.g., the level of computer literacy and/or the type and nature of tasks to be performed) and by scheduling uninterrupted training that includes hands-on courtroom experience as appropriate to the user. If users need basic computer training, the court should arrange for it to occur prior to training on the digital recording software. Courts must be willing to set aside sufficient time for on-going training and accommodate individual training needs as necessary.

(11) Implications of Adding Courtrooms or Chambers to the System

Courts wishing to "phase in" digital recording in a few courtrooms at a time must adhere to all procurement authority limitations. See section 16.4.5 of this chapter, "Delegation of Procurement Authority."

Courts using a centralized digital audio design that want to install systems in additional courtrooms must be aware that existing equipment and services may need to be enhanced to support expansion. Adding courtrooms to these systems will necessitate changes to existing hardware, requiring more support from systems staff, and may necessitate hiring personnel for that purpose.

To the extent that additional contractors are required to support infrastructure changes, it will be up to the court to coordinate the efforts of the various contractors so that each contractor can perform its responsibilities without other contractors acting as impediments. A good way to handle multiple contractors is to bring them together periodically for coordinating meetings.

(12) Implications of Running a Mixture of Analog and Digital Systems

Courts may decide to use digital recording systems in some, but not all, courtrooms that currently use electronic sound recording. Issues to consider include the following:

- Use of mixed recording modes may undercut the advantages of eliminating the older analog

technology.
- Court recorders may not be able to substitute for each other in different courtrooms unless cross-training is kept up on both systems.
- It may become complicated to produce tapes and obtain transcripts due to storage of the record in different modes and in different locations.
- Integration of existing analog systems with new digital systems is problematic; sound quality may be impacted adversely if parallel systems are maintained.

(13) Emergency Backup Planning

Courts may run their analog systems in parallel with the new digital systems as long as they deem necessary to mitigate risk to the record in the event of a malfunction. For courts that continue to use this mode for backup, the issues cited above regarding maintaining older technology, keeping up training, and locating recorded material will persist. Also, a major issue to be considered may be the need not only to split the audio signal from the microphone to feed into both the analog and digital systems, but also to amplify the signal to serve both recording systems. In some cases, installation of special equipment is required.

An alternative to an analog backup is to have an emergency "crash cart" pre- loaded with the digital audio system that can be substituted quickly in the courtroom if a system fails. However, there are drawbacks to this approach. The first is the cost associated with buying and maintaining an emergency backup, which must be kept current (i.e., loaded with current versions of the software and possibly even the function key "shortcuts") so that it can be substituted in the middle of court proceedings. Second, use of a crash cart resolves problems that arise from a faulty workstation in the courtroom, but would not necessarily compensate for server or network problems.

A second alternative that might be considered is use of a digital mini-disk recorder or laptop with sound input for emergency backup in court. This machine would not be able to reproduce a multi-track recording, but it could be substituted easily during a short break in proceedings. Since such a digital recorder would only record audio, the court recorder would have to revert to handwritten log notes. This approach addresses the cost and technology issues, but does not address the problem of having the log notes in a non- digital format. This potentially could be solved if the digital audio files from a different source, such as a mini-disk, could be transferred into the principal digital recording system with log notes to be added at a later time.

(14) Security Issues

Digital audio recording systems are computer systems, and therefore require a security plan in accordance with the Computer Security Act. This plan is essentially a written assessment of the security risks associated with the system, and how these risks have been mitigated, including countermeasures or defenses put in place.

For a digital audio recording system, such a plan would cover or include, but not be limited to, the following items:

- Authentication of valid users of the system, and written procedures covering authorized users and uses of the system.
- System level access protections allowing different kinds of access for different types of users, including features allowing locking of "private" annotation files, etc.
- Protections for the possible inadvertent connection to a building LAN that could allow access to unauthorized users.
- Protections for problems resulting from sending digital files to authorized users (such as transcription services) over transmission media that would allow access by unauthorized users. For example, sending unencrypted files over the Internet.
- Protections for the possible tapping of cables carrying such information.
- Protections for other unauthorized listening to sealed or other sensitive court proceedings.
- Written backup and recovery procedures to ensure availability of the files and also to prevent unauthorized access to backup media of sensitive proceedings.
- To the extent that courts opt to make digital audio recordings publicly available through the Internet or other electronic means, procedures must be in place to protect sensitive information and to preclude malicious or inadvertent disclosure or alteration.

Each court must develop its own procedures and ensure that the system handles and secures sealed and other sensitive matters.

(15) Information Resource Management Requirements

Courts must be familiar with the judiciary's Information Resource Management (IRM) policies to ensure compliance with the judiciary's current systems architecture and security requirements.

16.4.5 System Acquisition and Implementation Assistance

After conducting a needs assessment and defining requirements, the court must then develop a statement of work and select an acquisition method. Courts should refer to Volume 13, Chapter 14 of the *Guide to Judiciary Policies and Procedures* for procurement guidance.

Open Market/Small Purchase Procedure Option
The small purchase procedure provides an abbreviated and informal purchasing procedure for procurements from the open market not exceeding $25,000. This procedure requires local retention of evidence of price comparison for all procurements of $2,500 to $25,000. The small purchase procedure requires promoting competition to the maximum extent practicable, while ensuring that the purchase is most advantageous to the Government, price and other factors considered, including the administrative costs of making the purchase.

GSA Option
A court should consider fulfilling its requirements under a GSA schedule. To determine if schedule contractors can meet these needs, a market analysis can be performed to determine what systems are available that meet the court's requirements.

- Gather information on several systems from GSA providers, and request no- obligation on-site demonstrations of the systems as part of the market analysis. Obtain system information and cost estimates from vendors. Be sure vendors understand that the demo and estimated pricing are for information purposes only. Explain that, when the court is ready to purchase a system, an RFQ will be issued at a later date. All vendors invited to demo their systems should be included on the bid list.

- If a court intends to acquire a system on the GSA schedule contract, only vendors that are GSA-contract holders should be contacted to provide information and perform a demonstration. If open-market vendors compete with GSA vendors, and the winning vendor is an open-market vendor with a price that exceeds $25,000, the acquisition will need to be canceled because it was not conducted in accordance with judiciary procurement procedures . These procedures require full and open competition, including advertisement of the acquisition in the *Commerce Business Daily*, for all open-market purchases exceeding $25,000.

Courtroom Technologies Contracts Option
As of July 2000, the Administrative Office is in the process of modifying the courtroom technology contracts program to include digital audio recording systems. Such contracts may provide a future source for the acquisition and installation of digital audio systems. Interested courts should call the Procurement Management Division of the Administrative Office at 202-502-1330 for further information.

Delegation of Procurement Authority
If a court anticipates that the cost of its planned digital audio system purchase will exceed its Delegation of Procurement Authority (DPA), which is currently $50,000 for GSA schedule purchases or $25,000 for open-market purchases, it should contact the Procurement Management Division prior to beginning the acquisition process to request a one-time increase of its DPA contract authority for the purchase. Consideration of a DPA increase request from a court requires a case-by-case analysis and completion of specific procedures. (See Volume 13, Chapter 14 of the *Guide to Judiciary Policies and Procedures.*)

The court must prepare a request to the Chief, Procurement Management Division, requesting an increased delegation. Information to be provided in that request includes to whom the award will be made, the total amount of the purchase (including all option years, if applicable), and a description of the competition performed. This description should include the number of sources solicited, the number of respondents, whether the purchase would be under a General Services Administration (GSA) schedule contract, whether the award would be based upon a technically-acceptable, lowest-price, or best-value methodology, and any other pertinent information. Before considering evaluation on a best- value basis, contact the Procurement Management Division; it is imperative that courts obtain guidance when considering a best-value methodology. When all issues have been addressed, the Chief, Procurement Management Division, may grant the request in writing to the court for the increase in DPA.

Contracting Assistance
Courts that have questions about the procurement process should contact the Procurement Management

Division of the Administrative Office at 202-502-1330 for assistance.

Sound System Assistance

Courts whose sound systems require modification to install digital audio recording systems should contact their assigned program managers in the Space and Facilities Division (SFD), 202-502-1340 for design and installation assistance. The SFD can assist courts in locating professional audio-video designers under contract with SFD, and can also assist with consultation and/or infrastructure installation, such as wiring and cabling, by GSA.

Other Assistance

Courts with questions regarding these guidelines or the digital audio recording study should contact the digital audio program coordinators in the Bankruptcy Court Administration Division, 202-502-1540, or the District Court Administration Division, 202-502-1570.

 Back to Graphical Site

EXHIBIT 16.4-A: DESCRIPTION OF THE FEATURES OF A DIGITAL AUDIO RECORDING SYSTEM

The following table identifies several features that are associated with digital audio recording systems. For each feature we've included notes that identify its use and benefits and also any problems or disadvantages. We've constructed this table from information we learned during our interviews with participants in the pilot study, from the data forms that were returned, and from our observations of the systems operating in different court settings. While the list is not intended to be exhaustive of all the features a digital recording system could have, it does represent a set of features that may be of particular relevance when considering the use of digital recording in the federal courts.

Although most of these features were represented in the recording systems used during the pilot study, current systems by other vendors and particularly systems that become available in the future may include a subset of these features or, conversely, may provide functions that were not available during the pilot study. The core element of all digital audio recording systems is that they produce a digital representation of the audio input. Many of the benefits associated with digital recording (e.g., less storage space and more storage options, direct access to a selected portion of the recording, ability to copy or transmit the file electronically, ability to integrate the file with other data sources) are due primarily to the digital nature of the audio file and are independent of the recording application that produced the file. Beyond that basic functionality, however, different vendors have chosen to implement other features in order to provide their own multifaceted application. These other features provide additional capabilities or add to the system's reliability or ease of use. The ability of a court to assess its own needs and expectations for a digital recording system and then to match them to the features offered by a particular recording system will be an important component of the future success of these systems in the federal courts.

Specifications written to provide guidance to courts considering implementing digital recording, therefore, should emphasize flexibility and permit systems that provide a wide range of capabilities. This will allow vendors to tailor systems to the identified needs of the courts and to take advantage of changes in technology to provide ever expanding or efficient capabilities. Tightly written specifications today could limit the features available to the courts in the future. Similarly, requiring specific features beyond the minimum requirement of producing a quality audio recording in a digital format could add to the cost or complexity of systems and inhibit courts from making their own cost-benefit analysis and possibly choosing less fully-featured, but less expensive systems.

For each of the features listed below we have indicated whether we think that item should be an optional or required feature of digital recording systems used in the federal courts. Some features are labeled standard instead of optional to identify those that would most likely be included in a system that was intended to provide an integrated solution to recording extended courtroom proceedings (as opposed to chambers or telephonic proceedings). To preserve the flexibility encouraged above, most features are labeled optional or standard. However, even those described as required should be viewed very broadly. The requirement should attach to the functionality and whether it has been achieved with a particular implementation in the court and not necessarily that a selected application itself provides the feature. For example, having a long term backup copy of the digital audio files is a required security feature. However, the court could meet that requirement by implementing its own procedures for backing up the system's data disks without the system having to have its own integrated function. This would allow low-end systems to be used as backup systems for more fully featured primary systems or to digitally record proceedings that do not require or would not necessarily benefit from additional functionality (e.g., four channel recording of telephone conferences).

Feature	Status	Notes
AUDIO RECORDING:		
Sound processing	Required	This is the basic function of converting the analog audio signal received from the microphones into a digital signal. This function is usually done with special purpose hardware and/or software. Value added elements, often proprietary, include mechanisms to boost or clarify the signal. This is the core feature of every digital audio recording system. During the study several courts required the use of splitters in order to send the audio signal both to the digital recorders and to analog recorders that were being used as backups. Getting and installing the splitters was sometimes problematic, but the need for splitters should be much less in the future when

		concurrent analog recording is no longer used.
Confidence monitoring	Standard	This is a mechanism for ensuring that the audio signal has accurately been recorded to tape or disk. The mechanism accesses the already recorded signal from tape or disk (not the signal directly from the microphones) and transmits it to a headset worn by the court recorder. The sound in the monitoring headphones is usually offset from the live audio, often by 1 to 3 seconds. Longer delay times may be more difficult for the court recorder. Monitoring is done either continually or on a periodic basis throughout the session.
Multi-channel recording	Standard	This is a capability to keep the audio signals received from different microphones separate. This is helpful when listening to or transcribing a playback because the user can isolate a single channel to listen to while turning off the others, making it easier to hear what is being said in that microphone without competing audio from other microphones. A common configuration is for a courtroom to have 8 microphones for input and 4 recording channels on output. Using an audio mixer, the signals from the microphones are assigned to different audio channels (e.g., microphones at the plaintiffs' table and at the jury box would record on channel 2, while those at the defendants' table would record on channel 3). One of the channels, often 1, records the input from all microphones. Transcriptionists, in particular, benefit from multi-channel recording. A minimum of four channels is currently a requirement of analog electronic sound recording. 4-channel recording is beyond the level of recording done by typical off-the-shelf sound recording boards, which are usually 1-channel (mono) or 2-channel (stereo) recorders. Therefore specialized, sometimes proprietary, hardware and software is used to provide this feature. This feature is most useful when recording in locations where there are multiple, scattered sound sources and multiple speakers. It is possible that future sound systems may provide a greater number of recording channels to allow greater distinctions among speakers.
"Live" channel indicators	Optional	This feature visually displays information that informs the court recorder that recording is being done on different channels. The court recorder can then check microphones or channels that are not working properly.
Record playback	Optional	This is the ability to continue to record the session while playing back a portion of the record that was previously recorded. This feature would provide a more complete record because the record would include the comments made by attorneys and witnesses during the playback.
Storage mechanisms	Required	This feature pertains to the location where the audio signal is stored as a digital file. All of the products used during the study had primary storage on hard disk; this might have been on the disk of the recorder's workstation or on a local server. Two of the systems also had automated mechanisms for writing a copy of the session recording to secondary storage, either DAT tape or JAZ disk. If the system configuration included a central server, copies of the recording files were also written to the central server. The DAT tape or JAZ disk provides a mechanism for storing session material off-line, which can be restored to primary

		storage if older records that are no longer on-line are needed. Copying data to a central server allows material from different courtrooms to be available to others without having to have a connection to the courtroom server directly. Previously recorded material can be played back even while proceedings are still going on. This feature can facilitate short-turnaround transcription since material can be available on a very short delay.
Recording format	Required	This refers to the format in which the converted audio signal is written to disk or tape. There is currently no standard for this format; some systems choose to use proprietary formats and others choose more open, publicly available, formats. Systems typically also include a compression algorithm to reduce the size of the stored audio files. Using a proprietary format can allow a system to take advantage of new advances and efficiencies that can be built into the system. However, storing material in proprietary format makes the information less accessible in the future unless the proprietary application is available.
ANNOTATIONS:		
Integrated note taking	Standard	This refers to whether the system itself provides the general capability to take notes that are tied to time stamps marking particular sections of the audio recording. This mechanism includes storing the text notes (usually in a data base) and an integration utility that provides a method for directly accessing the desired audio segment once the timestamp of the annotation is known. Integrated note taking was a major component of all of the vendor systems that were used during the study. At the very basic level, each system performed this task; however, the mechanisms used were different and provided different options and capabilities. Although integrated note taking is likely to be included in a full-featured digital audio recording system, integrated notes are not required to realize many of the benefits of digital recording. Hand notes or notes taken with standard word processing software can be used instead, as long as a timestamp synchronized with the audio record is kept.
Session setup	Standard	This refers to the procedure for preparing to record a session, which involves entering identification information about the session (e.g., date and time, courtroom, judge) and other session specific information that will be used in the annotations (e.g., case numbers and names, attorney names, types of proceedings). Depending on the user interface, setup could also include assigning specific text to function keys, creating pick lists, verifying that there is good audio feed on all channels, verifying that primary and secondary storage mechanisms are functioning, etc. The setup procedures help ensure the smooth functioning of the system during the session and make available to the court recorders shortcuts that can be used while taking session notes. During the study, several court recorders commented that they would like to have been able to set up information for one session, or perhaps even one case, and have it carry over to another session of the same case so the information would

		not have to be entered again. Similarly, a couple of courts also would have liked the ability to integrate case information from their case management or calendaring system so it would not have to be entered independently.
Organization	Standard	This refers to the primary method for structuring, or categorizing, the recorded material so it is retrievable in the future (the "filing" method, so to speak). It potentially affects the way the annotations and identifiers are stored in the database, the directory structure used to store the files on disk, the way the digital recordings are captured on secondary storage (e.g., DAT tape or JAZ disks), and the logical first approach to searching for previously recorded material. A session-based structure is more akin to the current analog structure where all proceedings in a particular session are recorded together and desired material is retrieved by date and time. A case-based structure makes it easier to keep all the proceedings of a single case linked together regardless of when it was recorded. The different structures may also be more attuned to different types of proceedings (e.g., session-based is more useful for motions-day or calendar call proceedings, and case-based is more useful for multi-day trials). Regardless of the primary organization, both case and session information was captured in the systems and could be used to identify desired recorded material but with different levels of ease.
User interface	Standard	This is the "look and feel" of the system while the user (e.g., court recorder, judge, transcriptionist) is recording a session and/or performing other system specific tasks. Different components of the system may have different interfaces (e.g., the window for recording is not the same as the one for playback); however, there is usually a common approach to the interface that persists across components, making the transition from one task to another easier. Examples of variations in interfaces include the layout of the screen, the choice of whether to use pull down menus or function keys, the composition of the annotation (e.g., timestamp, identity of speaker, special note), the amount of information that is visible on the screen at once, whether "live" channels are indicated, etc. During the study, participants made several comments regarding what they liked and did not like about the interfaces they used. Having more information on the screen (e.g., being able to see a scrolling list of previous annotations as well as the current one) was considered a plus by several court recorders and transcriptionists. Criticisms of current systems included lack of flexibility in how annotations were structured, the need to use fields to store information other than what they were designed to store (e.g., putting a reference case identifier in the phone number field), limits on how much information could be entered, and functions that required too many mouse clicks.
Customization	Optional	This topic covers both the ability to make one time configuration choices that will affect the use of the system by all users (e.g., the ability to choose session-based or case-based organization or the standard screen layout) and the ability to make ad hoc changes to tailor the interface for each session, type of proceeding, case, etc. (e.g., assigning different text tags to function keys, creating pick lists, changing the size of the window). The former changes, if available, would most likely be made during installation of the system by the vendor. The latter changes are highly integrated with the user interface and often

		the vendor provides a mechanism for making the changes but the user makes them as needed. A third type of customization, the ability to choose only those system features that are needed, was available to a limited extent during the pilot, but it may be a more common element in the future. The ad hoc customizations were the ones most participants commented on when asked about this topic. In general, greater flexibility to make changes to fit the particular proceeding or case was preferred. Some participants also wanted the ability to pre-set different kinds of customizations (e.g., function key tags) so that they could be used more than once and so they could easily switch from one to another during a recording session.
Editing capabilities	Standard	This feature concerns the ability to make changes to annotations taken during a recording session, either immediately or after the session recording is over. This capability is important to court recorders because they often need to correct the spelling of a speaker's name or a technical term. It would also allow recorders to delete or modify erroneous notes or add new ones tagged to the appropriate timestamp. Annotations edited in this way are clearer, more complete, and more useful to transcriptionists and users searching for material to play back.
Field limits	Optional	This refers to whether or not there are limitations on how much information can be entered into a single field. Systems sometimes impose limits on the length of text fields in order to keep down space requirements. Limits that are too short, however, can impede the court recorder's ability to include complete information (e.g., the names of all of the defendants in a multi-defendant case).
Multiple annotators	Optional	Some systems provide a utility that allows users other than the court recorder (e.g., judges, law clerks) to take notes. Those notes are linked by timestamp to the audio and are maintained in the system database. The user has the option of letting others see these notes or keeping them private. These personal notes can assist the user in finding material for playback later because they can be searched just as the court recorder's notes can. This feature adds complexity to the basic recording system because it usually requires the networking of both court recorder and judge workstations to maintain synchronized timing and some additional security measures to keep private notes private.
PLAYBACK:		
Access	Required	This is the basic ability to listen to material that was previously recorded. All digital recording systems provide this capability, often using a proprietary function that is able to decode a proprietary recording format. Depending on the system configuration, access may have to be done from the court recorder's workstation or can be done from other networked locations (e.g., the workstation in chambers). The ability to do playbacks in chambers, on demand, without requiring assistance from the court recorder was a major benefit of the digital recording systems experienced by the pilot courts.

Search annotations	Standard	This is the ability to search through the annotations associated with a session recording to find specific material to play back or review. The ability to take complete notes and the ability to search on different fields (e.g., the fields with speaker names or event tags, in addition to the general notes field) enhances the usefulness of the search utility.
Search audio	Optional	This refers to the ability to search through the actual audio file, as opposed to the annotations, to find material to play back. At a basic level this can be done by skipping through the audio file and listening for the section you are interested in. This is usually accomplished by using some mechanism provided by the digital system to access material recorded at different time stamps. If, however, this feature is viewed as the ability to identify in the audio record a signal that represents certain material you want to select (e.g., search for the first occurrence of the discussion on "experts") then this is an extremely complex and difficult signal parsing task; it is unlikely it will become a feature of digital recording systems in the near future.
Highlight current tag	Optional	This feature refers to the ability of some digital recording systems to highlight on the screen the annotation associated with the audio that is being played back. As the audio advances the highlight bar scrolls down the annotations so that the user can see the visual synchronization of the two.
Channel isolation	Standard	This feature is closely associated with multi-channel recording discussed above. This allows the user to listen to material recorded on a specific channel, and perhaps enhance the clarity or volume of that signal, to make it easier to understand what is being said without the interference of sound recorded from other microphones. This feature is particularly useful to transcriptionists, when listening to material recorded from multiple microphone sources, and when speakers are difficult to hear.
ARCHIVE AND RESTORE:		
On-line capacity	Optional	This refers to the amount of primary storage disk space that is available on the local workstation or server to store the live, day-to-day, session records and annotations data base. The amount of disk space can vary greatly and range from several days to several weeks worth of information that could be maintained on-line. Once the on-line capacity is reached either a manual or automatic mechanism is used to remove older items to make way for new material. There must be an off-line copy of the material before this is done. Systems differ regarding whether only the audio files are removed from the disk or if both audio and annotations are removed. When older material is needed for playback or transcription it must be restored to the on-line disk to be accessible from the standard system interface. This restore function is usually done by the court recorder. The more on-line capacity the more likely the material needed will be readily available.
Off-line storage	Optional	The off-line storage mechanism can be a copy of the files on another server disk or on smaller removable media such as DAT tapes or JAZ disks. The DAT or JAZ options provide the benefit of keeping a small number of sessions together (e.g., a few days or a week) on a medium that can be catalogued and

		stored separately in a manner similar to the current storage of analog tapes. The material is then readily available to the court recorders if it needs to be restored to the on-line disk.
Find and restore	Standard	This feature pertains to the process of locating material that has been moved to off-line storage and restoring it to the on-line disk. Systems that automatically download data to a secondary storage medium, and that automatically free up on-line capacity by removing older sessions, are also likely to have an integrated function for keeping track of which sessions are on which tapes. That makes it easier to identify what needs to be restored. The court can also maintain its own cataloging system. The choice of organizational structure can affect how material gets copied to off-line storage and how it is searched for and restored.
Permanent archive	Required	One of the requirements for federal data records, including electronic sound recordings, is that they must be held for up to 10 years in case they need to be used in future proceedings. The recordings and text notes made by digital audio systems must also be accessible in the future. Unfortunately, as mentioned above, the recording systems often use proprietary formats to store their data files. If that was the only format the data files were ever stored in it is possible that recordings made in one court could not be accessed by a court that did not own a proprietary license for the vendor system that created the file. Similarly as technology changes and new capabilities are incorporated into recording systems, even if a court is still using the same vendor, it may have a difficult time restoring a recording that was several years old. This situation would interfere with the court's obligation to keep a copy of the record that is accessible to others now and in the future. There needs to be a mechanism, therefore, to export the audio recording and the annotation text from the digital recording system and produce a version of the material in a very basic, non-proprietary format, that is likely to avoid these future access issues as much as possible. There is currently no approved and implemented standard for digital audio files. However, the .WAV format for digital audio is a publicly available, non-proprietary format that can be accessed from many different products and utilities. Standard ASCII text files can be used as a standard format for the session information and annotations. This would provide a combined digital archive. It is also possible that a copy of the digital audio could be output to analog audio tape (a function that each of the current systems has because it is used to produce 4-track and 2-track tapes for the public) since this is the currently acceptable format for archiving analog recordings. This requirement to export files in a non-proprietary format for permanent archive need not and should not impinge on the vendor's ability to use proprietary formats or to take advantage of new algorithms or other changes in technology for the material maintained and accessed within the recording system (both on-line and off-line storage). The export conversion would only be invoked when a copy of recorded material was declared ready to go to the archive.

TRANSCRIPTION:

Selection of material	Optional	This feature refers to the ability to identify recorded material that needs to be sent to the transcriptionist (e.g., the 2-day trial held in a particular case). The standard search mechanisms used to locate desired material for playback are also used to locate this material. In some systems, the material for the entire session that includes the segment that needs to be transcribed is copied to a transfer medium. In other systems, the user is able to identify just the segment of the session that is desired and copy only that portion to a transfer medium. Some systems allow multiple segments to be copied to the same transfer medium. Both the audio recordings and the annotations are included in the material sent to the transcriptionist. A printout of the annotations can be included as well as the electronic version.
Transfer medium	Optional	This refers to the mechanism used to transfer the digital recordings and annotations to the transcriptionist. CD-ROMs, MO (magneto-optical) disks, and JAZ disks were the media used most often during the study. Because of the digital format, the material can also be transferred electronically over phone lines or network connections without the need for a separate physical transfer medium. Though electronic transmission was not used during the study, several courts commented they would like to use that method in the future.
Proprietary client software	Optional	This feature refers to a separate component of the digital recording system that is used by transcriptionists to access the material to be transcribed. The program is able to process the files copied to the transfer medium, which may still be in a proprietary format, and provides at least a method to listen to the recordings and advance through the audio, usually using a foot-pedal interface. For systems that use integrated note taking, the program provides a user-interface that displays the annotations synchronized to the recorded audio. It can also provide other features such as the visual highlighting of the annotation corresponding to the current audio, the ability to access the different audio channels and isolate them or change volume on each, and the ability to skip to a particular audio sequence directly either by selecting the associated annotation or by using other selection mechanisms provided through the screen interface. The need to use proprietary client software in order to transcribe digitally recorded material was an impediment for some courts during the pilot study. Transcriptionists did not want to purchase the necessary software licenses without knowing the volume of work they would receive from the courts or even if the use of digital recording would continue after the pilot phase. Some vendors assisted in resolving this problem by providing software, and sometimes hardware, to transcriptionists at little or no cost. Another approach taken by one of the vendors was to create a version of the client software that could be copied to the transfer medium along with the recordings and annotations so that the transcriptionist did not have to have a separate copy of the software.
Peripherals	Optional	This refers to peripheral devices needed by transcriptionists to transcribe digital recordings. These include the device needed to access the transfer medium (e.g., MO drive or CD-ROM drive), and the foot-pedal used with the proprietary client software, which may or may not be a standard configuration.

TAPE DUPLICATION:

Selection of material	Optional	This feature refers to the ability to identify recorded material that needs to be copied to tape for a requesting judge, court officer, attorney, member of the public, etc. The standard search mechanisms used to locate desired material for playback are also used to locate this material. In some systems, the material for the entire session that includes the segment requested is copied. In other systems, the user is able to identify just the segment of the session that is desired and copy only that portion to tape. Some systems allow multiple segments to be copied to the same tape. Only the audio recording is output to the tape in an analog, not digital, format. A printout of the annotations can be included if requested.
Multi-channel duplication	Optional	The output analog tape can be either a 4-channel tape or a 2-channel tape. 2-channel tapes are standard stereo cassette tapes that can be used in a standard tape player. 4-channel tapes are used in special tape players that can access all four channels. 4-channel tapes are often provided to transcriptionists, most other tape requests are for 2-channel tapes.
Duplication speed	Optional	This refers to how long it takes to create a duplicate tape. A "1x" duplication speed indicates that it would take 1 hour to copy a 1 hour tape; at "4x" it would take 15 minutes to copy 1 hour of audio. Some of the tape duplicating equipment used during the pilot study had tape duplication speeds of 16x or higher. Higher duplication speeds mean a quicker and less burdensome tape duplication process. Tape duplication equipment were relatively costly components of the digital recording systems used during the study. It is possible that in the future the need for tape duplication will be reduced. Essentially 4-channel tapes for transcriptionists could be eliminated. And, a mechanism for exporting digital audio in a non-proprietary format may replace the need for 2-channel tapes for general users. The digital audio could be transmitted electronically or on standard digital media such as CDROM, and the recipient could listen to it using a variety of multi-media utilities that can process non-proprietary audio files (e.g., .WAV files).

ADMINISTRATION:

User setup	Standard	This refers to the basic utilities used to add someone to the list of valid users of the system or to modify information about current users. During this setup procedure a username and password combination may be assigned as well as indications of the type and level of access allowed (e.g., a court recorder may have the privilege to edit annotations for sessions he/she personally recorded, but would not have those access rights for sessions recorded by others). In some systems it may be possible to establish certain customizations for each user, such as the parameters or elements of the user's screen interface.
Security and privileges	Optional	Building on the item above, this feature refers to the procedures used to provide basic identity checking to ensure that a potential user is a valid user of the system, and that he/she is provided the required level of access but no more. For systems that allow non-court recorders to take annotations and/or allow users to declare their annotations "private", there must be some security procedures to lock and unlock those files.

Maintenance functions	Standard	This refers to the requirement or opportunity of court personnel to perform standard setup and maintenance functions for the system, including identifying network routing parameters, defining disk structures, correcting network interfaces, rebuilding damaged databases, and making adjustments to accommodate disk storage requirements. Some vendor systems may provide utilities for performing these functions, others may not give court personnel access.
Emergency backup	Standard	This feature refers to the equipment and procedures to be used when the primary recording system fails and is unable to take the record of a proceeding. This function could be handled in several different ways including: having a spare workstation with the digital recording system loaded on it that could be pressed into service to continue recording; reverting to using a backup analog recorder and taking hand notes; using a low-end digital system, such as a laptop with a recording sound board to take the audio record and taking hand notes. It is likely that whichever backup method is used, the audio recording and the notes will not be in the same format as material recorded with the digital system (this may be true even with a spare system workstation). Therefore, the emergency plan may also include a method for entering the recording and annotations taken with the backup system into the primary digital recording system so that there are no gaps in the material accessible through the digital system. Having a backup procedure that can be put in place quickly is important, otherwise system failures could cause longer disruptions to court. Solutions that can be invoked by the court recorder rather than requiring the assistance of systems staff would be quicker.
Long term backup	Required	This refers to the need to have an off-line backup of the audio files and annotations database for disaster recovery. In some systems, the session DAT tapes or JAZ disks provide a secondary storage mechanism that could fulfill this function. Also periodic backups of the disks on the servers or workstations as part of the normal preventive maintenance routines could fulfill this function, even though the material from the digital recordings may be intermixed with general files from other court servers.
Management reports	Optional	This refers to utilities that provide basic reports on the status and contents of the system files and database. A great deal of peripheral information is captured by the digital recording system about each recording session. This information may be useful in identifying frequency and patterns of use, needs for training, and capacity planning.
VENDOR SUPPORT:		
On-site evaluation	Standard	This refers to an early technical evaluation of the components of the digital system that are needed to provide the level of service the court wants. It includes an assessment of hardware and software, whether existing equipment can be used, how the interface to the network will be handled, and what physical changes may need to be made in the court (e.g., cabling or sound system).
Installation	Standard	This refers to the actual installation of all system components, hardware and software, in the court location. It includes testing,

		initial setup of parameters or special customizations, and interfacing with the court's network where appropriate. Some vendors may choose to pre-install software and perform customizations prior to the physical installation at the court.
Startup training	Standard	This refers to training provided by the vendor in the care and use of the system. Several different types of users need to be trained (e.g., court recorders, judges, systems staff). The amount of time spent and the specific topics covered will vary according to the tasks the user will be required to perform. Training sessions during live or mock courtroom proceedings were helpful to court recorders during the pilot study.
On-going support	Optional	After installation and training are complete and the system is functioning properly, the vendor may provide on-going support for the system to troubleshoot and correct any new problems that occur, to provide additional training, or to make modifications or enhancements requested by the user. Phone support (i.e., the ability to call a technical support operator and ask for assistance in solving a problem) or on-line support (i.e., the ability of the vendor to access the court's system via phone or network connections to run diagnostics, examine error files, or perform corrective actions) are the most common levels of support provided as part of the standard maintenance agreement. On-site support where the vendor physically returns to the court to provide maintenance and service is less often provided by vendors without a special maintenance contract.
Upgrades	Standard	This refers to whether periodic upgrades (either providing new functionality or correcting identified problems) are included as part of the maintenance agreement. Upgrades can be user-installable, can be installed via on-line support or may require on-site support depending on the complexity of the upgrade.
SYSTEM COMPONENTS:		
Proprietary software	Standard	This refers to the software programs that constitute the digital recording systems. Most, but not necessarily all, functionality provided by the system will be through completely proprietary components or through proprietary interfaces to other generally available utilities or packages (e.g., the vendor may supply its own editing functions, or it may link to a standard word processing package). The vendor may sell the system bundled (i.e., all functionality is purchased together as a unit) or unbundled (i.e., components are separate and buyers can choose the components they need). Similarly, licensing to use the system may extend to the entire functionality or be limited to particular components. Licenses may be calculated on a per-user basis, by groups, or sites.
Proprietary hardware	Optional	This refers to hardware components of the system that are provided by the vendor and cannot (at least under normal circumstances) be substituted for by other more generic equipment. Sound processing equipment (e.g., sound boards, mixers and voice processors) are often proprietary hardware. Tape duplication equipment, especially those providing very high transfer speeds may also be proprietary.
Dedicated hardware	Optional	This refers to workstations, servers, disk and tape drives, power protection equipment, modems, etc. that are dedicated to the functioning of the digital recording system. They do not, however, need to be purchased from the vendor as long as the configuration meets the vendor's required specifications.

CONFIGURATIONS:		
Standalone system	Optional	This is a recording configuration in which all of the system components are running on or attached directly to the court recorder's workstation. The system is not connected to other computers; this limits direct data sharing but isolates the system from network related problems.
Networked systems	Optional	This is a recording configuration in which the system components (e.g., workstations and servers) participate in a networked environment that allows data sharing (e.g., recorded information stored on the workstation in the courtroom can be accessed by the workstation in chambers) and shared use of storage devices and other peripherals. The digital system can participate in the court's common network or run on its own isolated segment.
Central server	Optional	This is a variation of the networked configuration. In this configuration recorded material and database information is not only stored on the workstation or server associated with each courtroom, but it is also copied to a central location. This central repository provides another backup copy of the data as well as allowing access to recorded material without having to access the courtroom servers directly.
Monitoring multiple courtrooms	Optional	This is a recording configuration in which video and audio signals are sent from several courtrooms to servers and monitoring equipment in a single centralized control room. This approach requires less equipment in the courtroom and allows for more efficient use of servers, storage disks, and other peripherals. A court recorder in the central location can record and monitor sessions being held in more than one courtroom at a time. However, detailed note taking may only be occurring for one courtroom, while the others receive only basic monitoring. This configuration was not used during the pilot study, but one court is investigating the possibility of installing centralized systems if digital recording is approved.
INTEGRATION:		
Importing data from an external source	Optional	This feature is the ability to integrate into the system digital audio recordings and/or annotation text that were created by a method other than the standard session recordings done by the system. This would allow, for example, digital recordings done in chambers or by emergency backup systems to be linked in with the other recordings done by the court. That way the system database has all, not just most, of the recordings made by the court and selection of material for playback or transcription can be done using a single utility and result in a more complete record. This feature can also refer to the ability to read in data produced by other systems (e.g., calendaring information, or attorney identifiers) to use during setup or annotating.
Exporting data in a standard non-proprietary format	Optional	Integration goes both ways. The digital nature of the recording makes it possible for the file to be imported or linked in with other systems (e.g., case management system), but for that to be possible it is most likely that the recordings would need to be in a non-proprietary format.

Accessibility of data by non-system utilities	Optional	Though similar to the feature above, this refers to the ability to read the actual digital recording system files (not exported copies) using utilities (e.g., multi-media audio processors that come standard with sound boards or operating systems) other than the digital recording system.

Attachment 5

District of Nebraska
Digital Recording Lessons Learned

Courtroom Procedures
Attorneys must talk **directly** into microphones.

Acoustics
Study courtroom acoustics. If acoustical concerns currently exist in a courtroom, problems will become more pronounced when transcriptionists transcribe hearings and trials from digital recordings.

We added acoustical panels added to the Omaha courtrooms.

Sounds Systems
Courtrooms need to have excellent sound systems.

We started with four channel systems, and we are now upgrading most systems to eight channels, which requires a reconfiguration. We have recently converted some courtrooms to eight channel cards because we needed one channel to record all channels in order to upload the files to the electronic case filing system (CM/ECF).

Transcriptionists appreciate microphones separated on more channels, but the eight channel cards are more expensive.

Carefully consider and then test microphone placement. Sidebars create special difficulties.

Impact on Staff
Most of the information technology staff time was spent getting software VoiceIQ to work with our business practices. For example, we needed more flexibility in the manner in which the digital recording system accepts case information. The system did not work well for multi-defendant and civil cases.

The information technology staff did not experience many problems with the digital system itself.

While VoiceIQ provided some training for staff, information technology staff had to provide additional training for courtroom deputies.

The best information technology staff person to assign to a digital recording project is a person with a background in hardware, software, and electronics.

The magistrate courtroom deputies formerly recorded hearings on tape decks. The job of Judge Kopf's courtroom deputy changed the most when the court transitioned to digital

recording because Judge Kopf, an Article III judge, previously used a full-time court reporter.

Machines can break, so there may be downtime. Our courtroom deputies perform a sound check on all microphones at the beginning of each day to ensure that everything is working properly.

Court staff was required to train contract transcriptionists on new software. The change to digital software changed the court's business practices because it previously sent tapes to transcriptionists. The court now burns CDs to send to contract transcriptionists. Staff court reporters download hearings and trials directly from the network.

Digital recording reduced the burden on court staff of contracting with non-staff court reporters.

Vendors
Available vendors include DCR; FTR; VoiceIQ; and CourtSmart. DCR was not in business when the court went through the competitive bid process.

If possible, try to deal directly with the manufacturer instead of the reseller. The court experienced several problems and delays when it could not work directly with VoiceIQ and had to work directly with the reseller.

Equipment
To save money, buy servers from a different source than the digital recording vendor.

The playback feature was not user friendly. We bought additional switch boxes to make it easier for courtroom deputies to play back portions of hearings.

Courtroom deputies have two monitors in the courtroom – one to monitor the digital VU meters and the other to perform other work.